Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 4:01 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Tue, 26 Aug 2008 17:30:23 EDT
Subject: Public Comment (Technical)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-26_13:2008-08-25,2008-08-26,2008-08-26 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808260178
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 611

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 2nd bullet point under Objective 3

Comment: The statement that there was no redundancy for the water supply for the low zone sprinkler system is incorrect. The secondary water supply for the low zone sprinkler system was the fire department connection.

The upper sprinkler system zones in the building were provided with gravity tanks as a secondary water supply due to the high pressure required to be pumped into the fire department connection to reach the higher zones.

Reason for Comment: The statement that the low zone water supply did not have a redundant water supply is incorrect. The low zone water supply did not have an automatic secondary water supply, which is different from not have a redundant supply.

Suggestion for Revision: The statement should be revised to be technically accurrate.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 4:01 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Editorial)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Mon, 25 Aug 2008 17:40:47 EDT
Subject: Public Comment (Editorial)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-25_05:2008-08-25,2008-08-25,2008-08-25 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808250180
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 390

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 3rd paragraph/last sentence

Comment: The term "ceiling beams" is used in this sentence. I assume that this term is intended to mean floor beams.

Reason for Comment: The term "ceiling beams" is an imprecise term.

Suggestion for Revision: If the term "ceiling beams" is intended to refer to floor beams, it is suggested that the term "floor beams" be used.

It's only a deal if it's where *you* want to go. Find your travel deal **here**.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 4:01 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Editorial)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Mon, 25 Aug 2008 17:25:24 EDT
Subject: Public Comment (Editorial)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-25_05:2008-08-25,2008-08-25,2008-08-25 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808250175
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 386

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 2nd paragraph/1st sentence

Comment: The word "rich" is sort of rich with meaning, but probably shouldn't be used in a formal report.

Reason for Comment: The word "rich" as used in the report probably should not be used in a formal report.

Suggestion for Revision: Suggest using the word "extensive" in lieu of the word "rich".

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Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 4:01 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Mon, 25 Aug 2008 15:06:31 EDT
Subject: Public Comment (Technical)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-25_05:2008-08-25,2008-08-25,2008-08-25 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808250138
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 372

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) Last sentence on page

Comment: There isn't much information on the design of the sprinkler system, however, in the low zone, it is possible that operating sprinklers would have a water supply from the sprinkler piping higher in the zone (if check valves were not provided at each connection to the sprinkler riser). In other words, the sprinkler/standpipe piping located on higher floors would act as a gravity tank supplying sprinklers on lower floors.

Assuming that sprinkler piping in the low sprinkler zone was broken when the building was struck with debris from the collapse of WTC 1, the supply for operating sprinklers would not have lasted for any significant length of time.

Reason for Comment: In several places in the report, statements are made that there was no water

supply for the sprinkler systems, in particular the low zone. This is only technically accurate if check valves were provided at each connection of the sprinkler piping on the floors to the riser. If check valves were not provided at this location, the sprinkler piping on the upper floors of the low zone would act as a gravity tank for operating sprinklers on lower floors in the zone.

Suggestion for Revision: It is suggested that the issue of whether or not there were check valves in the sprinkler system at each connection to the riser be addressed. Depending on whether or not there were check valves, a discussion of whether or not the piping on the upper floors acted as a gravity tank to supply operating sprinklers or broken piping on the lower floors may be required.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 4:01 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Mon, 25 Aug 2008 14:39:49 EDT
Subject: Public Comment (Technical)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-25_05:2008-08-25,2008-08-25,2008-08-25 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808250129
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 363 (pdf page 25)

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 3rd point in the 1st paragraph in the "Floor-to-Floor Fire Spread" section.

Comment: This point appears to make the assumption that the only means of spread of fire between floors is via the outside of the building. Fire spread between floors is possible through the opening between the edge of the floor slab and the curtain wall if this space is not firestopped properly. Obviously, floor-to-floor fire spread could also occur through improperly firestopped obvious in the floor construction. I believe I am correct in saying that the principle means of fire spread between floors in the One Meridian Plaza Building fire was through improperly firestopped openings in the floor construction, not via the exterior of the building.
The granite spandrel panels would likely have prevented floor-to-floor fire spread.

Reason for Comment: To this point in the report, there has been no discussion of the firestopping provided for the opening between the floor construction and the curtain wall.

Suggestion for Revision: The firestopping details and installation at the intersection of the floor construction and the curtain wall needs to be addressed in this report.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 3:59 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Mon, 25 Aug 2008 13:03:31 EDT
Subject: Public Comment (Technical)
To: WTC@nist.gov
CC: Nadine_Post@mcgraw-hill.com
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-25_05:2008-08-25,2008-08-25,2008-08-25 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808250107
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 361 (pdf page 23)

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 3rd paragraph/2nd sentence

Comment: Typically there is an opening between the edge of the floor construction and the curtain wall. Up until this point in the report, I have not seen any description or discussion of the construction details of this space. If this space existed in the construction, how was this space firestopped? This detail is extremely important to the investigation.

It is my experience that the space between the floor and the curtain wall is often improperly detailed or improperly installed.

Reason for Comment: The sentence in question indicates that there was no pathway for flames and heat to pass from one floor to the floor above. This is only true if the space between the curtain

wall and the floor is properly firestopped.

Suggestion for Revision: This construction detail should be addressed in the report.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 2:58 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Mon, 25 Aug 2008 09:49:22 EDT
Subject: Public Comment (Technical)
To: WTC@nist.gov
CC: Nadine_Post@mcgraw-hill.com
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808250066
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 358

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) Section 8.10

Comment: This entire section fails to mention the lack of manual fire suppression efforts. As indicated in another comment, the simple act of pre-wetting combustible by the FDNY would have completely changed the heat exposure to the building structure. The tactic of pre-wetting by fire fighters was utilized to control the fire in the First Interstate Bank Building. Similarly, pre-wetting by sprinklers was able to control the spread of fire in the One Meridian Plaza Building. (The tactic of pre-wetting is also used to control wild land fires.) In other words, the initiating event (other than fire ignition) was the decision to abandon the building and let the building burn.

Reason for Comment: Section 8.10 only addresses the collapse from a structural point of view. If

temperatures had been reduced by "pre-wetting" the combustibles, the temperatures to which the building structure were exposed would likely been significantly reduced and the collapse avoided.

Avoiding the issue of the lack of manual suppression efforts, avoids the question of whether or not building should be designed assuming both the failure of the sprinkler system and the total failure of the fire department.

Although the water supply in Lower Manhattan had failed due to the collapse of WTC 1 and WTC 2, water supply was available from the Hudson River and from hydrants located further north. The FDNY is a large enough fire department that water supply relay (engine pumping to engine through 4 inch, 5 inch or 6 inch supply lines) from hydrants further north could have been established.

It also appears that the sprinkler system serving the low zone in the building could have been supplied through the fire department connection. Although the sprinkler system was damaged, so far in the report, NIST has not estimated the extent of the damage to the sprinkler system.

The intent of this comment is not to criticize FDNY for their decision not to fight the fire, but rather to indicate that in most fires, the fire department has options and the probability that both the sprinkler system will be ineffective and that manual fire suppression will be totally ineffective is miniscule. **Again, the question that needs to be answered clearly is whether we expect our buildings to be designed to withstand a 9/11 attack or whether our buildings should be designed for typical events.**

Suggestion for Revision: Suggest that the lack of manual suppression activities be considered as a direct cause of the collapse.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 2:57 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Mon, 25 Aug 2008 09:05:31 EDT
Subject: Public Comment (Technical)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808250061
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 342 (pdf page 393)

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) last paragraph/

Comment: The paragraph does not address the fact that there were no manual fire suppression efforts. Even minimal manual fire suppression efforts in the building would have reduced the exposure of the structural system to heat generated by the fires.

Reason for Comment: The paragraph neglects to address the issue of the effects of manual fire suppression on the fire. In the fire in the First Interstate Bank Building, the LAFD was able to prevent the spread of fire up the building by, in effect, pre-wetting the combustible on the floors above the fire. Any pre-wetting of combustibles by the FDNY would have reduced the heat exposure to the WTC 7 structural systems and, more than likely, prevented the collapse of the building. Hence, it could be stated that the lack of any attempt to manually suppress the fires in the

building, combined with the structural damage to the building from the collapse of the adjacent structures, was the proximate cause of the collapse.

Suggestion for Revision: Suggest that importance of the lack of manual fire suppression by the FDNY be considered.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 2:57 PM
To: Stephen Cauffman
Subject: FW: NIST WTC 7 Draft Report-Beam Fire Ratings

X-Sieve: CMU Sieve 2.3
From: Shyam Sunder <sunder@nist.gov>
To: "'wtc@nist.gov'" <wtc@nist.gov>
CC: Stephen Cauffman <cauffman@nist.gov>, Gail Crum <crum@nist.gov>
Date: Mon, 25 Aug 2008 07:47:05 -0400
Subject: FW: NIST WTC 7 Draft Report-Beam Fire Ratings
Thread-Topic: NIST WTC 7 Draft Report-Beam Fire Ratings
Thread-Index: AckGTryx8NmwO4j2RTuBupaYN++kWAAWkeLw
Accept-Language: en-US
X-MS-Has-Attach:
X-MS-TNEF-Correlator:
acceptlanguage: en-US
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: sunder@nist.gov
X-NIST-MailScanner-Information:

Dr. S. Shyam Sunder
Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-5900; Fax: 301-975-4032

From: FPESCHULTE@aol.com [mailto:FPESCHULTE@aol.com]
Sent: Sunday, August 24, 2008 9:11 PM
To: Shyam Sunder
Cc: Nadine_Post@mcgraw-hill.com
Subject: Re: NIST WTC 7 Draft Report-Beam Fire Ratings

In a message dated 8/24/2008 7:36:14 P.M. Central Daylight Time, sunder@nist.gov writes:

> The sentence relating to the beams should read they had SFRM consistent with a 2 hour rating. This statement is in error and will be fixed tomorrow. In other parts of the report, including findings, you will see reference to the beams having SFRM consistent with a 2 hour rating.
>
> The fire rating and SFRM for the buildings were consistent with 1-B classification/specification for unsprinklered buildings (3 hour columns and 2 hour floors) even though the buildings had sprinklers. This was confirmed by the Port Authority.
>
> We also talk about the lack of water for the sprinklers, the effect of the structural damage, and the fact these were uncontrolled fires later in the report under principal findings and recommendations.

Thanks Shyam. You're working late tonight.

rich

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 2:57 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Mon, 25 Aug 2008 08:54:38 EDT
Subject: Public Comment (Technical)
To: WTC@nist.gov
CC: Nadine_Post@mcgraw-hill.com
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808250057
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 341 (pdf page 393)

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 3rd paragraph/1st sentence

Comment: The sentence does not mention that WTC 7 is the only building of the four which incurred significant structural damage immediately prior to the fires.

Reason for Comment: One of the most significant questions which should at least be attempted to be answered in the report was whether or not the structural damage prior to the fires played a significant role in the collapse of the building. The "key" question to be answered is: Would WTC 7 have collapsed if no structural damage had been occurred immediately prior to the fires?

Suggestion for Revision: See above.

It's only a deal if it's where *you* want to go. Find your travel deal **here**.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 2:08 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Editorial)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sun, 24 Aug 2008 18:28:02 EDT
Subject: Public Comment (Editorial)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808240262
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 341

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 1st paragraph/last sentence

Comment: The National Institute of Standards and Technology is normally abbreviated NIST, not Nist.

Reason for Comment: Just editorial. (Who in the hell edited this report?)

Suggestion for Revision: Replace Nist with NIST.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 2:08 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical/Editorial)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sun, 24 Aug 2008 16:23:25 EDT
Subject: Public Comment (Technical/Editorial)
To: WTC@nist.gov
CC: Nadine_Post@mcgraw-hill.com
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808240224
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 314

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) section 7.4.2/1st paragraph

Comment: Not to be picky, but the attack on the WTC towers did not begin at 8:46:30 AM. While it could be arguable, it is my opinion that the attack began with the hi-jacking of the aircraft. The time noted is the time at which the aircraft struck the towers.

Reason for Comment: Indicating that the attack began at 8:46:30 seems to imply that the hi-jackers did not plan the attack and that the collision of the aircraft with the towers was accidental.

It is likely that the passengers and crew of the hi-jacked aircraft (as well as United Airlines and American Airlines) would disagree that the attack began at 8:46:30, if the passengers and crew were still alive. Out of respect for the passengers and crew of the hi-jacked aircraft who were

slaughtered, the statement which reference the time the attack began should be changed.

Suggestion for Revision: No suggestions. Just a comment.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 2:08 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sun, 24 Aug 2008 16:12:39 EDT
Subject: Public Comment (Technical)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808240224
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 311

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) Section 7.2.3

Comment: NIST estimates the capacity of the elevators for emergency evacuation. No criteria is given for how the capacity was determined, other than the criteria that the engineers used to determine the capacity.

In the high rise building in which I live, elevators seems to be constantly "out-of-service" for one reason or another. (The elevator equipment was damaged when the City of New Orleans was flooded as a result of Hurricane Katrina.) Given this, it is suggested that the report also address the reliability of elevators when used for evacuation purposes. It appears that the engineers' calculations and NIST's calculations assume that all of the elevators are operable. Elevators taken out of service for equipment maintenance or for purposes of moving furniture should be

considered.

Reason for Comment: The criteria for determining the capacity of elevators is time-dependent. Hence, a criteria which establishes a time in which the evacuation is to be accomplished must have been utilized to determine the capacity. It appears that NIST utilized the same criteria as the engineers to determine the capacity. If this is the case, it is recommended that NIST specifically state that this is the case so that readers will be 100 percent sure that this is the time criteria being utilized.

Suggestion for Revision: Explicitly state the time criteria being used to determine the evacuation capacity of the elevators.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 2:07 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Editorial)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sun, 24 Aug 2008 15:33:32 EDT
Subject: Public Comment (Editorial)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=1 spamscore=1 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808240213
X-PP-SpamScore: 1
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 309

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 2 paragraph/1st sentence

Comment: It is recommended that the term "design occupant load" be used rather than "nominal maximum occupant load".

Reason for Comment: The maximum floor occupant load is determined based upon the egress capacity provided. The computation of dividing the floor area by 100 SF/person produces the minimum occupant load for which the egress facilities serving an office floor would be required to be designed.

Most codes allow the occupant load of a floor to exceed the minimum occupant load provided that sufficient egress facilities are provided. For example, an occupant load which produces an average occupant load of 80 SF/person would be permitted on an office floor provided that the egress

facilities provided are sufficient.

Suggestion for Revision: Substitute the term "design occupant load" rather than "nominal maximum occupant load".

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 2:07 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sun, 24 Aug 2008 16:01:00 EDT
Subject: Public Comment (Technical)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808240222
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 313

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) Section 7.3.2

Comment: This section only appears to address a fire emergency within the building. It would seem that utilizing the elevators for an emergency other than a fire emergency within the building would be acceptable, i.e. an aircraft purposely flies into an adjacent building.

Reason for Comment: This section seems to have forgotten that the use of elevators to address non-fire emergencies within the building should be acceptable.

Suggestion for Revision: No suggestion for a revision.

It's only a deal if it's where *you* want to go. Find your travel deal **here**.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 1:31 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Editorial)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sun, 24 Aug 2008 09:09:53 EDT
Subject: Public Comment (Editorial)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808240094
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 125

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 3rd paragraph/1st sentence.

Comment: It is assumed that the reference to Broadway refers to a street name,not a section of Manhattan. Hence, the report should refer to Broadway Street, not simply Broadway.

Reason for Comment: The NIST report is intended to be a formal report. Hence, the report should be in a formal style, not conversational style.

Suggestion for Revision: Use the term Broadway Street, rather than simply Broadway.

It's only a deal if it's where *you* want to go. Find your travel deal **here**.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 1:30 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sat, 23 Aug 2008 12:11:03 EDT
To: WTC@nist.gov
CC: Nadine_Post@mcgraw-hill.com
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808230074
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
Subject: Public Comment
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: xxxvi

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 1st paragraph/2nd point

Comment: Item (b) in the 2nd point reads as follows:

"(b) provide the technical basis for cost-effective improvements to national building codes . . . . "

NIST has previously stated that NIST has not determined the cost of complying with the proposed recommendations. NIST has also stated that NIST has not performed a "cost/benefit" analysis and that it is not NIST's responsibility to determine either costs or to do a cost/benefit analysis.

Assuming that NIST's statements regarding developing cost impact and a cost/benefit analysis are correct, how does NIST know that NIST's proposal are "cost-effective improvements"?

Reason for Comment: Assuming that NIST's statements regarding developing cost impact and a cost/benefit analysis are correct, how does NIST know that NIST's proposal are "cost-effective improvements"?

In the prior reports on the WTC towers, NIST has not provided a technical basis for NIST's recommendations. Dr. Sunder has disputed this fact, however, if NIST has provided the technical basis, then NIST should be able to point to the technical basis for each recommendation. To my knowledge, NIST has not done so to date (simply because the reports do not contain a concise technical basis for each recommendation).

Once again, it is my recommendation that the technical basis for each recommendation be included immediately following each recommendation so that readers of the report do not have to search all 10,000 pages of the various reports in an attempt to find "the technical basis needle" in the 10,000 page "haystack".

Suggestion for Revision: Either include a cost analysis and cost/benefit analysis for each recommendation or delete any reference as to whether or not the recommendations are "cost effective".

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 1:30 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sat, 23 Aug 2008 13:25:43 EDT
Subject: Public Comment (Technical)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808230085
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 33

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 3rd paragraph/last sentence

Comment: Structural steel frames with bolted or welded connections are considered to be restrained. It's really a simple concept with structural steel frames. The same can be said for concrete floor construction.

Reason for Comment: The NIST tests at Underwriters Laboratories in August 2004 were tests on trusses. Structural steel frames and concrete floor construction react differently than trusses to thermal restraint. The paragraph as written implies that the structural fire resistance of restrained structural steel frames and concrete floors is less than unrestrained construction. That notion is simply incorrect.

It should be noted that the reactions to fire where a floor assembly is simultaneously exposed to fire

from both above and below is different from a floor assembly where the floor is only exposed from below.

Suggestion for Revision: The paragraph should be rewritten so that it is technically correct. If the fire resistance tests on trusses is to be referenced in this paragraph, it is suggested that it be specifically stated that the August 2004 tests involved trusses, not structural steel frames.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 1:30 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sat, 23 Aug 2008 13:32:40 EDT
Subject: Public Comment (Technical)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808230090
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 33

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 6th paragraph/4th sentence

Comment: The statement that there are no code requirements for inspection of existing spray-applied fireproofing is incorrect. The International Fire Code (IFC) specifically requires that all fire protection systems, including fireproofing materials, be maintained over the life of a building. Further, the IFC specifically permits the fire code official to make inspections of fireproofing materials.

Reason for Comment: The statement contained in the draft regarding the inspection of existing structural fire protection (fireproofing materials) is incorrect.

It should be noted that, while the IFC requires that fireproofing materials for structural steel be maintained and authorizes the fire official to make periodic inspections of the fireproofing

materials, most fire authorities fail to enforce this provision of the code. This is an enforcement issue.

Suggestion for Revision: Modify the paragraph so that it correctly addresses the issue. The failure of fire code enforcement officials to properly enforce the code.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 1:30 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sat, 23 Aug 2008 12:41:41 EDT
Subject: Public Comment (Technical)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808230082
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 75 and 76

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 5th paragraph, page 75; 2nd paragraph, page 76

Comment: The 3rd sentence in the 5th paragraph on page 75 indicates that a 4 sprinkler array cover roughly 750 square feet. The 1st sentence in the first full paragraph of page 76 indicates that the sprinkler spacing is 168 SF. 4 times 168 equals 672 SF. 672 SF vs. 750 SF, which is it?

Reason for Comment: 672 SF and 750 SF are two different values for the area protected by 4 sprinklers. 672 SF is not approximately 750 SF.

Suggestion for Revision: Reconcile the differences between these two values.

It's only a deal if it's where *you* want to go. Find your travel deal **here**.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 1:30 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment NCSTAR 1-9

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sat, 23 Aug 2008 11:59:03 EDT
Subject: Public Comment NCSTAR 1-9
To: WTC@nist.gov
CC: Nadine_Post@mcgraw-hill.com
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808230074
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: xxxiv

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) Last paragraph/2nd sentence

Comment: The second sentence of this paragraph makes reference to "effecting necessary change". It is my opinion that the consensus that has developed is that the recommendations proposed by NIST are unnecessary change. Hence, a reference to "necessary" change is only NIST's opinion.

Reason for Comment: It has been 7 years since the terrorist attacks on 9/11 and no further major terrorist attack within the United States have occurred. Some (mainly Democrats) would ascribe this mostly to luck, while others (mainly Republicans) credit the United States military and the Department of Homeland Security, along with our intelligence agencies, the FBI and the CIA, with

taking the necessary steps to prevent another attack.

The record of the last 7 years calls into question whether the implementation of NIST's recommendations is actually necessary. While a consensus that the implementation of some changes may have developed in the immediate aftermath of 9/11/2001, it is clear that such a consensus no longer exists. The events which have occurred on September 11th are rarely mentioned in Congress or in the political campaigns.

It is unlikely that most Americans have forgotten that day, however, offensive tactics against terrorism have proved to be both effective and efficient. It is my opinion that most Americans now realize that defensive tactics, such as those proposed by NIST, will be both costly and ineffective.

America is a "target-rich" country. If we improve our defenses in new high rise buildings, terrorists can simply attack older high rise buildings or other buildings such as shopping malls or our transportation infrastructure. NIST's recommendations barely scratch the surface of improving America's defenses against terrorism.

Addressing terrorism in every building and all of America's other infrastructure would likely bankrupt the country without making an appreciable change in America's vulnerability to terrorism. The NIST proposals are simply changes so that the Government can say that Washington is addressing the problem, while accomplishing little or nothing.

Suggestion for Revision: The NIST investigation should stick to the facts and not offer opinions, other than those relevant to the investigation.

If NIST wants to express opinions in the investigation report, the report should clearly indicate that an opinion is being expressed and include a qualifier that the opinion expressed is not necessarily the opinion of the Administration, Congress or the American people. I don't believe that NIST speaks for the current Congress, the Bush Administration or the American people on this subject.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 1:30 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Editorial/Technical)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sat, 23 Aug 2008 11:27:57 EDT
Subject: Public Comment (Editorial/Technical)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808230069
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte
Affiliation: (Optional) Schulte & Associates
Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com
Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9
Page Number: xxxi
Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 3rd paragraph/1st sentence

Comment: The events in New York on September 11th are referred to as a "disaster". The events of September 11th were not a disaster, but a planned "military-style" attack on the World Trade Center towers and an attack on the economy of the United States.

Reason for Comment: No one that I know has ever referred to the dropping of atomic bombs on Hiroshima and Nagasaki in August 1945 as disasters, nor is the fire bombing of Dresden and other cities in Germany during World War II considered to be a disaster. Hiroshima, Nagasake and Dresden were planned military attacks on civilian populations. Given this, the September 11th attacks on the World Trade Center towers utilizing hi-jacked civilian aircraft as missiles in "kamakazi' attacks should not be referred to as a disaster.

Suggestion for Revision: Utilize the word "attack" rather than "disaster".

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Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 1:29 PM
To: Stephen Cauffman
Subject: Fwd: Public Comment (Editorial)

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sun, 24 Aug 2008 08:58:43 EDT
Subject: Public Comment (Editorial)
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=1 spamscore=1 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808240094
X-PP-SpamScore: 1
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 120

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 2nd (complete) paragraph/2nd sentence

Comment: The report indicates that data sheets were created using Microsoft Excel. Is it really necessary to identify the computer software program utilized to create a spreadsheet?

Reason for Comment: The results determined from the data sheets would be the same, regardless of software manufacturer. Hence, the manufacturer of the software is irrelevant to the results. It should be noted that the report does not identify the manufacturers of the camera and video equipment used to take photographs and video. The reason for that is that the manufacturers of the cameras and video equipment is irrelevant to the conclusions drawn. The report should be consistent, either identify the manufacturers of all equipment used in the investigation or none of the manufacturers.

Suggestion for Revision: Delete the reference to Microsoft.

It's only a deal if it's where *you* want to go. Find your travel deal **here**.

Stephen Cauffman

From: wtc@nist.gov
Sent: Friday, September 05, 2008 9:57 AM
To: Stephen Cauffman
Subject: Fwd: Public Comment

X-Sieve: CMU Sieve 2.3
From: FPESCHULTE@aol.com
Date: Sat, 23 Aug 2008 10:03:24 EDT
Subject: Public Comment
To: WTC@nist.gov
X-Mailer: 9.0 Security Edition for Windows sub 15301
X-Spam-Flag: NO
X-Proofpoint-Virus-Version: vendor=fsecure engine=1.12.7160:2.4.4,1.2.40,4.0.166 definitions=2008-08-22_05:2008-08-21,2008-08-22,2008-08-21 signatures=0
X-PP-SpamDetails: rule=spampolicy1_notspam policy=spampolicy1 score=0 spamscore=0 ipscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam adjust=0 reason=mlx engine=5.0.0-0805090000 definitions=main-0808230056
X-PP-SpamScore: 0
X-NIST-MailScanner: Found to be clean
X-NIST-MailScanner-From: fpeschulte@aol.com
X-NIST-MailScanner-Information:

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 48

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) 5th (last) paragraph; last line on the page

Comment: Suggest that the report utilize the term "suspended ceiling", rather than "drop ceiling".

Reason for Comment: The term "drop ceiling" is slang for "suspended ceiling".

Suggestion for Revision: Substitute the term "suspended ceiling" for the term "drop ceiling" throughout the report.

It's only a deal if it's where *you* want to go. Find your travel deal **here**.

From: Shyam Sunder <sunder@nist.gov>
To: "'wtc@nist.gov'" <wtc@nist.gov>
Subject: FW: NIST WTC 7 Draft Report-Beam Fire Ratings

Dr. S. Shyam Sunder
Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-5900; Fax: 301-975-4032

From: FPESCHULTE@aol.com [mailto:FPESCHULTE@aol.com]
Sent: Sunday, August 24, 2008 9:11 PM
To: Shyam Sunder
Cc: Nadine_Post@mcgraw-hill.com
Subject: Re: NIST WTC 7 Draft Report-Beam Fire Ratings

In a message dated 8/24/2008 7:36:14 P.M. Central Daylight Time, sunder@nist.gov writes:

> The sentence relating to the beams should read they had SFRM consistent with a 2 hour rating. This statement is in error and will be fixed tomorrow. In other parts of the report, including findings, you will see reference to the beams having SFRM consistent with a 2 hour rating.
>
> The fire rating and SFRM for the buildings were consistent with 1-B classification/specification for unsprinklered buildings (3 hour columns and 2 hour floors) even though the buildings had sprinklers. This was confirmed by the Port Authority.
>
> We also talk about the lack of water for the sprinklers, the effect of the structural damage, and the fact these were uncontrolled fires later in the report under principal findings and recommendations.

Thanks Shyam. You're working late tonight.

rich

From: Shyam Sunder <sunder@nist.gov>
To: "John L. Gross" <jgross@nist.gov ...snip... wtc@nist.gov'" <wtc@nist.gov>
Subject: FW: Public Comment (Technical)

Dr. S. Shyam Sunder
Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-5900; Fax: 301-975-4032

From: Shyam Sunder
Sent: Monday, August 25, 2008 11:48 AM
To: 'Post, Nadine'
Cc: Gail Crum
Subject: RE: Public Comment (Technical)

Nadine,

We have reviewed both comments you sent this moring. A few points are worth noting:

1. The intent of current codes is that building components and subassemblies resist fires (represented by the ASTM E 119 time-temperature relationship) without any pre-wetting to reduce temperatures.
2. WTC 7 was unable to resist the fires (real fires, not the more conservative ASMT E 119 fires), due primarily to the effects of thermal expansion which are not explicitly considered in current design practice.
3. The draft NIST report explicitly states that (1) the sprinkler system did not function since water supply was cut off and (2) the fires burned uncontrolled without any manual fire suppression.
4. The key premise of NIST's recommendation is that buildings should not collapse in infrequent (worst-case) fires that may occur when active fire protection systems are rendered ineffective. Both sprinklers and manual suppression are considered to be active fire protection systems.

Shyam

Dr. S. Shyam Sunder
Director
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From: Post, Nadine [mailto:nadine_post@mcgraw-hill.com]
Sent: Monday, August 25, 2008 10:17 AM
To: Shyam Sunder
Subject: FW: Public Comment (Technical)

Shyam: Pls. address this comment from Rich Schulte as you did his comment about the 1-hr

fire rating. I will be sending you other comments (from Rich and others) for your reaction, as well.
Thanks, Nadine

Nadine M. Post
Editor-at-Large
Buildings--Design and Construction
Engineering News-Record
McGraw-Hill Construction Media
2 Penn Plaza, 9th fl
New York, N.Y. 10121-2298
w: 212-904-4139
f: 212-904-2820

------ Forwarded Message
From: <FPESCHULTE@aol.com>
Date: Mon, 25 Aug 2008 09:49:22 EDT
To: <WTC@nist.gov>
Cc: <Nadine_Post@mcgraw-hill.com>
Subject: Public Comment (Technical)

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional)
fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 358

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4)
Section 8.10

Comment: This entire section fails to mention the lack of manual fire suppression efforts. As indicated in another comment, the simple act of pre-wetting combustible by the FDNY would have completely changed the heat exposure to the building structure. The tactic of pre-wetting by fire fighters was utilized to control the fire in the First Interstate Bank

Building. Similarly, pre-wetting by sprinklers was able to control the spread of fire in the One Meridian Plaza Building. (The tactic of pre-wetting is also used to control wild land fires.) In other words, the initiating event (other than fire ignition) was the decision to abandon the building and let the building burn.

Reason for Comment: Section 8.10 only addresses the collapse from a structural point of view. If temperatures had been reduced by "pre-wetting" the combustibles, the temperatures to which the building structure were exposed would likely been significantly reduced and the collapse avoided.

Avoiding the issue of the lack of manual suppression efforts, avoids the question of whether or not building should be designed assuming both the failure of the sprinkler system and the total failure of the fire department.

Although the water supply in Lower Manhattan had failed due to the collapse of WTC 1 and WTC 2, water supply was available from the Hudson River and from hydrants located further north. The FDNY is a large enough fire department that water supply relay (engine pumping to engine through 4 inch, 5 inch or 6 inch supply lines) from hydrants further north could have been established.

It also appears that the sprinkler system serving the low zone in the building could have been supplied through the fire department connection. Although the

sprinkler system was damaged, so far in the report, NIST has not estimated the extent of the damage to the sprinkler system.

The intent of this comment is not to criticize FDNY for their decision not to fight the fire, but rather to indicate that in most fires, the fire department has options and the probability that both the sprinkler system will be ineffective and that manual fire suppression will be totally ineffective is miniscule.

Again, the question that needs to be answered clearly is whether we expect our buildings to be designed to withstand a 9/11 attack or whether our buildings should be designed for typical events.

Suggestion for Revision: Suggest that the lack of manual suppression activities be considered as a direct cause of the collapse.

------ End of Forwarded Message

From: Shyam Sunder <sunder@nist.gov>
To: "John L. Gross" <jgross@nist.gov ...snip... wtc@nist.gov'" <wtc@nist.gov>
Subject: FW: Request from ENR

Dr. S. Shyam Sunder
Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-5900; Fax: 301-975-4032

From: Post, Nadine [mailto:nadine_post@mcgraw-hill.com]
Sent: Monday, August 25, 2008 10:17 AM
To: Shyam Sunder
Subject: FW: Request from ENR

Here's another.

Nadine M. Post
Editor-at-Large
Buildings--Design and Construction
Engineering News-Record
McGraw-Hill Construction Media
2 Penn Plaza, 9th fl
New York, N.Y. 10121-2298
w: 212-904-4139
f: 212-904-2820

------ Forwarded Message
From: <FPESCHULTE@aol.com>
Date: Mon, 25 Aug 2008 09:08:00 EDT
To: <Nadine_Post@mcgraw-hill.com>
Subject: Fwd: Public Comment (Technical)

------ End of Forwarded Message

From: "FPESCHULTE@aol.com" <FPESCHULTE@aol.com>
To: "WTC@nist.gov" <WTC@nist.gov>
Date: Mon, 25 Aug 2008 09:05:31 -0400
Subject: Public Comment (Technical)
Thread-Topic: Public Comment (Technical)
Thread-Index: AckGvJ+xNkoTuitiTAamFK8rAnNZAw==
Message-ID: <c76.2db6827a.35e4081b@aol.com>
X-MS-Has-Attach:
X-MS-TNEF-Correlator:
full-name: FPESCHULTE
Content-Type: multipart/alternative;
boundary="_000_c762db6827a35e4081baolcom_"
MIME-Version: 1.0

Name: (Optional) Richard Schulte

Affiliation: (Optional) Schulte & Associates

Contact: Phone number or e-mail address where you can be contacted in case of questions. (Optional) fpeschulte@aol.com

Report Number: (e.g., NCSTAR 1-1) NCSTAR 1-9

Page Number: 342 (pdf page 393)

Paragraph/Sentence: (e.g., paragraph 2/sentences 2-4) last paragraph/

Comment: The paragraph does not address the fact that there were no manual fire suppression efforts. Even minimal manual fire suppression efforts in the building would have reduced the exposure of the structural system to heat generated by the fires.

Reason for Comment: The paragraph neglects to address the issue of the effects of manual fire suppression on the fire. In the fire in the First Interstate Bank Building, the LAFD was able to prevent the spread of fire up the building by, in effect, pre-wetting the combustible on the floors above the fire. Any pre-wetting of combustibles by the FDNY would have reduced the heat exposure to the WTC 7 structural systems and, more than likely, prevented the collapse of the building. Hence, it could be stated that the lack of any attempt to manually suppress the fires in the building, combined with the structural damage to the building from the collapse of the adjacent structures, was the proximate cause of the collapse.

Suggestion for Revision: Suggest that importance of the lack of manual fire suppression by the FDNY be considered.

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov'" <terri@nist.gov ...snip... Cauffman <cauffman@nist.gov>
Subject: FW: Beam Ratings; W/D ratios

Dr. S. Shyam Sunder
Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-5900; Fax: 301-975-4032

From: Shyam Sunder
Sent: Tuesday, August 26, 2008 9:46 AM
To: 'FPESCHULTE@aol.com'
Cc: Nadine_Post@mcgraw-hill.com; Pregrp@aol.com; Gail Crum
Subject: RE: Beam Ratings; W/D ratios

Rich,

Most of the major beams used for the east and north side floor system were W24x55; just a few were W21x44. The smaller beams (W12s) were secondary framing elements they would not have a significant affect on the thermal response of the floor system.

We did calculations for both 5/8" and 3/4" SFRM thickness, representing 25 percent and 50 percent greater thickness than the 0.5" restrained SFRM thickness that was used based on current practice.

Our conclusion, see page 54 of the NCSTAR 1A, states:

> "It is unlikely that the collapse of WTC 7 would have been prevented had the insulation thickness on the floor beams been increased by 50 percent (from ½ in. to ¾ in.). NIST calculations indicated that the time to reach the steel temperature of 649 °C (1200 °F) would have increased by about 10 min to 20 min."

While we have not done a calculation for 7/8" SFRM thickness, it is unlikely that increased SFRM thickness would have made much difference, since thermal expansion effects occur at temperatures well below the 649 ° C (1200 °F) and the time delay due to the increased SFRM thickness would have been minimal. The shear studs between the beam and the concrete slab failed due to differential thermal expansion, not due to reduced strength and stiffness which occurs at higher temperatures.

In addition, as we have shown previously for the floor system used in the WTC towers, there are significant thermally-induced scale effects not considered in current practice, i.e., the ASTM E 119 test method. Specifically, most ASTM E 119 tests are done in furnaces smaller than about 20 ft. Our WTC tower floor tests indicated that even if an acceptable fire rating is obtained in a standard size furnace, the fire rating of the full-scale subassembly may be less than acceptable. In WTC 7, the floor system was as much as three times as long as the typical furnace test specimen.

Finally, it was *not the rating of the composite floor subassembly itself that governed the fire-induced collapse initiation process; instead, it was the effect of the thermally expanded floor subassembly on adjacent girders critical to structural stability. In short, the failure of the critical girder was not dictated by its own fire rating.* That is why it is essential to account for the thermal interactions between components and subassemblies, including connections, which make up a structural system. Just using unrestrained ratings will not address this key

problem.

Shyam

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From: FPESCHULTE@aol.com [mailto:FPESCHULTE@aol.com]
Sent: Monday, August 25, 2008 8:46 PM
To: Shyam Sunder
Cc: Nadine_Post@mcgraw-hill.com; Pregrp@aol.com
Subject: Beam Ratings; W/D ratios

Shyam-

The following are W/D ratios for the various beam sizes shown in **Figure 8-16**. (The W/D ratio are from Chapter 7 in the IBC.)

W8X28	W/D = 0.80	**1 hour unrestrained rating w/ 1/2 inch SFRM**
W12X19	W/D = 0.53	**NOT OK**
W12X26	W/D = 0.60	**NOT OK**
W12X30	W/D = 0.69	**NOT OK**
W21x44	W/D = 0.73	**NOT OK**
W24X55	W/D = 0.82	OK
W33X130	W/D = 1.31	OK

Based upon NIST structural analysis, it is my opinion that many of the floor beams in the building should have been considered to be unrestrained, rather than restrained. (Section 8.7 in the NIST report.) Given this, it would appear that many of the beams in the building had a fire resistance rating of < 1 hour and that it would be improper to consider many of the beams to have a 2 hour rating.

This is not to point a finger at the fireproofing contractor or architect for the building, but rather to indicate that their is a problem with how "restraint" was determined-a problem with ASTM E119 and the UL Fire Resistance Directory ever since the issue of restrained vs. unrestrained ratings were included.

If I recall correctly, the Uniform Building Code (UBC) required all assemblies to be considered to be unrestrained, unless structural calculations were submitted to justify a restrained classification. I am not sure how long this provision was included in the UBC.

Section 703.2.3 the 2006 IBC requires that the design professional certify that restraint is achieved in order for restrained fire resistance ratings to be used. This provision essentially requires structural calculations to demonstrate restraint, although many design professionals would simply point to ASTM E119 and the UL Fire Resistance Directory.

It would be interesting to know what would have happened from a structural standpoint if the thickness of the SFRM would have been 7/8 inch thick in order to meet the requirement for a 2 hour restrained rating, rather than 1/2 inch thick.

rich

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov'" <terri@nist.gov ...snip... rgann@nist.gov'" <rgann@nist.gov>
Subject: FW: Section 13.2, NIST Report WTC 7

Dr. S. Shyam Sunder
Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-5900; Fax: 301-975-4032

From: Shyam Sunder
Sent: Tuesday, August 26, 2008 5:56 PM
To: 'FPESCHULTE@aol.com'; Nadine_Post@mcgraw-hill.com
Cc: Pregrp@aol.com; Gail Crum
Subject: RE: Section 13.2, NIST Report WTC 7

Rich,

Our report states that observations support a single point of fire ignition on any given floor in WTC 7. We also state that there were no obvious pathways for the flames and heat to pass from one floor to another, aside from the debris damaged area in the southwest corner of the building. We also did not see flame spread outside the building.

The fires in WTC 7 were similar to fires in the other buildings cited due to seven specific factors we identify in the report:

1. Ordinary combustibles and combustible load levels.
2. Local fire origin on any given floor.
3. No widespread use of accelerants.
4. Consecutive fire spread from combustible to combustible.
5. Fire-induced window breakage providing ventilation for continued fire spread and accelerated fire growth.
6. Concurrent fires on multiple floors.
7. Active fire protection systems rendered ineffective (sprinklers and manual suppression systems).

Shyam

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Tel.: 301-975-5900; Fax: 301-975-4032

From: FPESCHULTE@aol.com [mailto:FPESCHULTE@aol.com]
Sent: Tuesday, August 26, 2008 5:47 PM

To: Nadine_Post@mcgraw-hill.com
Cc: Shyam Sunder; Pregrp@aol.com
Subject: Section 13.2, NIST Report WTC 7

Nadine-

Item 9 on page 602 of the report indicates that the collapse of WTC 1 caused the ignition of fires on 10 separate floors. These floors occurred in groups-7/8/9, 11/12/13, 19, 22, 29/30.

Based upon what I have read in the report, I do not believe that this is the case. **NIST indicates that 6 separate fires must have occurred on Floors 7, 8, 9, 11, 12 and 13 because NIST did not see any indication of flame spread outside the building.**

My opinion is that the collapse of WTC 1 caused fires on Floors 7 and 11 and that the fires spread to floors 8 and 9 and 12 and 13 through either improperly firestopped penetrations or through the improperly firestopped space between the edge of the floor construction and the exterior curtain wall. In other words, the fire spread was interior to the building. This would account for the fire spread on various floors lagging each other.

NIST cites both fire in the First Interstate Bank Building and the One Meridian Plaza Building as examples of where fires spread between floors on the exterior of the building, however, the fire spread in the One Meridian Plaza Building was interior, not exterior. The fire spread through improperly firestopped penetrations.

Just as an aside, fire spread between floors occurred in the fire at the Las Vegas Hilton Hotle fire in 1981. If I recall correctly, in this fire, the fire spread 8 floors in 25 minutes via the outside of the building-window to window above.

The NIST report on WTC 7 includes no information on the firestopping detail of the space between the edge of the floor construction and the curtain wall. This is a glaring omission in the report.

rich

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov'" <terri@nist.gov ...snip... Cauffman <cauffman@nist.gov>
Subject: FW: Section 14.2. WTC 7 report

Dr. S. Shyam Sunder
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From: Shyam Sunder
Sent: Tuesday, August 26, 2008 6:07 PM
To: 'FPESCHULTE@aol.com'; Nadine_Post@mcgraw-hill.com
Cc: Pregrp@aol.com; Gail Crum
Subject: RE: Section 14.2. WTC 7 report

Rich,

I have tried to answer these questions in my several previous responses. Thermal expansion effects are fundamentally different from loss of structural strength and stiffness which is the basis of ASTM E 119. This method simply does not work when interaction effects between components/subassemblies dominate the thermal response. ASTM E 119 is not capable of representing such interaction since it only tests single components/subassemblies.

Shyam

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From: FPESCHULTE@aol.com [mailto:FPESCHULTE@aol.com]
Sent: Tuesday, August 26, 2008 6:06 PM
To: Nadine_Post@mcgraw-hill.com
Cc: Shyam Sunder; Pregrp@aol.com
Subject: Section 14.2. WTC 7 report

Nadine-

The second bullet point under Objective One in Section 14.2 reads as follows:

"The collapse of WTC 7 represents the first known instance of the total collapse of a tall building primarily due to fires. The collapse could not have been prevented

without controlling the fires before most of the combustible building contents were consumed."

A number of errors in this statement. First, many people consider WTC 1 and WTC 2 to be total collapses of a tall building due primarily to fire. (I am not one of these people, but WTC 1 and WTC 2 are the first buildings which come to mind.) Second, it is my opinion that the collapse of WTC 7 was due to an error in applying the "restrained" fire resistance ratings, rather than the "unrestrained" fire resistance ratings.

Although the NIST report indicates that increasing the thickness of the fireproofing from 1/2 inch to 7/8 inch on the floor beams and girders would have only increased the structural capabilities a very short time, this statement is simply not logical. A fire on an office floor with a fire loading of 6.4 pounds per square foot does not cause beams with a 2 hour rating to loose their structural capabilities. This is simply not logical.

How can an increase in the thickness of the insulation increase the fire rating by 1 hour in an ASTM E119 test, but only increase the actual fire resistance rating of a structural member by only a few minutes? A 2 hour exposure to the ASTM E119 time-temperature curve is far more severe that an exposure to a real fire with a fire loading of only 6.4 pounds. No way is a 20 or 30 minute exposure in a real fire more severe than a 2 hour exposure to ASTM E119. The temperatures which develop in the real fire may be higher than those in the ASME E119 test for a very short period of time, but for only a few minutes.

Something is amiss here.

rich

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov'" <terri@nist.gov ...snip... Sadek'" <fahim.sadek@nist.gov>
Subject: FW: Section 14.2. WTC 7 report

Dr. S. Shyam Sunder
Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-5900; Fax: 301-975-4032

From: Shyam Sunder
Sent: Tuesday, August 26, 2008 6:25 PM
To: 'FPESCHULTE@aol.com'
Cc: Gail Crum
Subject: RE: Section 14.2. WTC 7 report

Rich,

I really appreciate your note. This was indeed the issue that perplexed me for the past several months as we conducted the analysis. I probed this issue to satisfy myself adequately. My sense is that this topic will require much more study before we can fully understand this interplay. We are committed to ongoing research in this area and would welcome contributions from other researchers. This is an important problem around which we need to get our arms around. I will pass on this note to my colleagues so we can be in touch as we pursue the research.

Shyam

Dr. S. Shyam Sunder
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From: FPESCHULTE@aol.com [mailto:FPESCHULTE@aol.com]
Sent: Tuesday, August 26, 2008 6:25 PM
To: Shyam Sunder
Subject: Re: Section 14.2. WTC 7 report

In a message dated 8/26/2008 5:12:21 P.M. Central Daylight Time, sunder@nist.gov writes:

> I have tried to answer these questions in my several previous responses. Thermal expansion effects are fundamentally different from loss of structural strength and stiffness which is the basis of ASTM E 119. This method simply does not work when interaction effects between components/subassemblies dominate the thermal response. ASTM E 119 is not capable of representing such interaction since it only tests single components/subassemblies.

Shyam-

You're response to my e-mail note was **excellent** and the report does an **excellent** job of illustrating the point of the expansion of the structural members exposed to fire. **(And I mean that sincerely.)** You've convinced me and I agree 100 percent with the structural analysis, however, what puzzles me is the fact that an additional 3/8 inch of SFRM will only provide a short increase in the fire resistance. An additional 3/8 inch of SFRM should knock the temperatures of the steel down quite a bit, hence, significantly reducing the forces which develop in the beams as they expand. A 20 or 30 minute fire should be no match against a 2 hour beam. A 20 or 30 minute fire against a beam which only has a 50 minute fire resistance rating is another thing.

I don't have the capabilities to redo NIST's calculations, but I am just applying logic and common sense. Perhaps Arup can take a look at this.

rich

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov'" <terri@nist.gov>,
...snip... <rgann@nist.gov>
Subject: Fw: Section 13.2, NIST Report WTC 7

From: FPESCHULTE@aol.com
To: Shyam Sunder
Cc: Nadine_Post@mcgraw-hill.com
Sent: Tue Aug 26 18:28:39 2008
Subject: Re: Section 13.2, NIST Report WTC 7

In a message dated 8/26/2008 5:22:09 P.M. Central Daylight Time, sunder@nist.gov writes:

> I appreciate your field experience and your comments below. The key point we make is that the fires in WTC 7 had characteristics similar to those experienced in several other buildings. Our report cites the seven characteristic that make them similar.

Shyam-

Again, an excellent analysis, however, the report makes the point that the other buildings were symmetrical, while WTC 7 had an assymetrical design. An excellent observation. And an observation which leads me to question the use of restrained ratings vs. unrestrained ratings.

It's my opinion that the guidelines for the use of the "restrained" rating in ASTM E119 and the UL test standard are not definitive enough and are actually misleading. The report does an excellent job of making this point.

rich

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov"' <terri@nist.gov ...snip... Cauffman <cauffman@nist.gov>
Subject: Fw: Further comment

From: Shyam Sunder
To: 'FPESCHULTE@aol.com'
Cc: 'Nadine_Post@mcgraw-hill.com'
Sent: Wed Aug 27 23:04:26 2008
Subject: Re: Further comment

Rich,

As always thank you for your incisive and insightful comments. Our position is consistent with the NFPA approach to design fire scenarios and the chavacteristics we have identified for them is consistent with fires experienced in several tall buildings. The intent clearly is not for multi-floor fires to be synchronized as you have inferred but again to be consistent with prior fires.

Shyam

From: FPESCHULTE@aol.com
To: Shyam Sunder
Cc: Nadine_Post@mcgraw-hill.com
Sent: Wed Aug 27 20:03:10 2008
Subject: Re: Further comment

Shyam-

My apologies. Thank you for taking the time to send me back to your previous e-mail notes. I'm in New Orleans right now and everybody, including me, is a little bit skittish. Right now, the NOAA has predicted landfall of Hurricane Gustav at the Louisiana/Mississippi line about 30 miles from New Orleans. Almost exactly were Katrina went through. Katrina made landfall about 6 AM on a Monday morning. It looks like Gustav will also make landfall on a Monday, but a little later in the day. Of course, NOAA 5 day predictions are actually anywhere between the Florida Panhandle and Houston-about 500 miles of coastline.

Item 6 on the list is the one that I'm not sure of. The fire starts in exactly the same place on every floor at exactly the same time? Highly improbable.

Does the fire loading change every time a tenant changes? That is certainly possible. I keep hearing how the fire loading has been increasing due to new materials (plastics) and that the fire loading now is much higher than it was in the 1940's. Of course, that is nonsense that the passive fire protection salesmen use to sell their passive fire protection products. The fire loading has been decreasing as time goes by-most of the finishes in a building are noncombustible these days.

In fire protection, active fire protection generally refers to sprinklers. The use of the term active fire protection to include manual fire fighting is new to me and to most everyone in the fire protection field. The typical terms are automatic fire protection, manual fire protection and passive fire protection with egress being separate from the three terms, although I've heard egress being considered to be passive fire protection lately (again by the passive fire protection salesmen).

In my mind, assuming the failure of both the sprinkler and standpipe systems, while possible, is simply so improbable that it is the same as assuming a simultaneous hurricane and snowstorm. The only time this has

ever happened is on September 11th. Note that at the One Meridian Plaza fire, the standpipe system failed, but the sprinkler system functioned (beautifully, I might add).

NFPA 14 requires that each standpipe riser be provided with a control valve at the base of the riser, so that in the event that a riser breaks, the broken riser can be isolated. Each standpipe system in a high rise building is required to be provided with two water supply sources, an automatic water supply and the fire department connection. Often, fire departments require two fire department connections and will supply both fire department connections in case a pumper malfunctions. The likelihood of a standpipe system failure is minimal if the system is tested properly.

My concern is that NIST's recommendation is looking for absolute perfection in the protection that we provide for occupants of a building. Absolute perfection is nice, but there comes a time when we need to simply stop engineering and get on with it. The NFPA statistics indicate that the average number of Americans who die in all of the office buildings in the United States in 1 over the past several years. More than likely that means the number of Americans who die in high rise office buildings protected by a sprinkler system is 0. We can't do any better than that. Right now, over 40,000 Americans die in traffic accidents every year and close to 100,000 Americans die as a result of medical errors in hospitals. What is the justification for spending any more money than we are already spending on high rise office building fire safety when that money could be used to reduce the number of traffic fatalities or the number of fatalities from medical errors in hospitals.

Whether you die in a fire, die in a traffic accident or die as a result of a hospital medical error, you're still dead. The question that I have is it morally acceptable to continue to spend more and more money on building fire safety when that same money could be allocated to reducing the number of deaths that occur due to traffic accidents or medical errors? I don't think that there is any moral justification for continuing to throw money at a problem that has been solved. I think that an average of 1 person per year dying as a result of fires in office buildings is as close to zero as we are going to get.

I have been looking at the number of deaths that occur due to lightning strikes. The number varies from 40 to 70 Americans dying each year due to lightning strikes. Given the probability of being struck by lightning and being killed are just about 0, it difficult for me to understand why we need to be concerned about 1 person per year dying in office building fires. It's time to pat ourselves on the back for doing a great job and move on to the next problem.

Given the choice between what NIST has recommended and sprinkler protection in 1- and 2-family dwellings, my choice would be sprinkler protection in dwellings. The cost/benefit of sprinklers in dwellings is far greater than the cost/benefit of considering fire as a design load. Sometimes it's difficult to see the forest for the trees. The objective is to save lives, not just save lives from fire.

Don't mean to lecture you, but after studying the fire statistics for more than 20 years, I've come to the conclusion that we sure waste a whole lot of money on fire protection. I just read an article yesterday asking the question whether or not the United States Government is bankrupt. When we continually throw money at problems, regardless of whether or not we actually accomplish anything, sooner or later we're going to end up being bankrupt. When voters figure out that they can vote themselves money by voting for politicians who pander to them, then sooner or later the producers decide it's not worth it to produce and the whole thing comes apart.

Without a cost/benefit analysis to justify the need to implement NIST's recommendation, I simply can't support the recommendation. We need to address probable events, like traffic accidents, before we try to address events that simply don't happened (i.e. simultaneous hurricanes and snow storms).

I really appreciate you taking the time to walk me through the report. I'm sure that the above has bored you to death, but maybe it will help you get to sleep tonight.

Regards-

Rich

The fires in WTC 7 were similar to fires in the other buildings cited due to seven specific factors we identify in the report:

1. Ordinary combustibles and combustible load levels.
2. Local fire origin on any given floor.
3. No widespread use of accelerants.
4. Consecutive fire spread from combustible to combustible.
5. Fire-induced window breakage providing ventilation for continued fire spread and accelerated fire growth.
6. Concurrent fires on multiple floors.
7. Active fire protection systems rendered ineffective (sprinklers and manual suppression systems).

In a message dated 8/27/2008 5:54:33 P.M. Central Daylight Time, sunder@nist.gov writes:

> We have identified the seven key characteristics of these infrequent (worst-case) fires in the report. I included them in one of my responses yesterday.
>
> Shyam
>
> ---
>
> **From:** FPESCHULTE@aol.com <fpeschulte@aol.com>
> **To:** Nadine_Post@mcgraw-hill.com <nadine_post@mcgraw-hill.com>
> **Cc:** Shyam Sunder; Pregrp@aol.com <pregrp@aol.com>
> **Sent:** Wed Aug 27 17:35:52 2008
> **Subject:** Further comment
>
> "The intent of current practice, based on prescriptive standards and codes, is to achieve life safety, not collapse prevention. However, the key premise of NIST's recommendations is that buildings should not collapse in infrequent (worst-case) fires that may occur when active fire protection systems are rendered ineffective, e.g., when sprinklers do not exist, are not functional, or are overwhelmed by the fire."
>
> **Comment: The recommendation, as stated, is not specific enough to determine what NIST has in mind. Just what does NIST actually mean when they refer to "worst-case" fires?**
>
> **The "worst-case" fire in a building would assume simultaneous fires on all floors in the building, all reaching their peak temperatures throughout every floor simultaneously. The probability of this scenario is essentially the same as having the worst-case earthquake while simultaneously having a hurricane and a snowstorm. In order for NIST's recommendation to be meaningful, NIST needs to clarify what the term "worst-case" is actually intended to mean.**
>
> **While NIST's recommendation indicates that the design scenario assumes that the sprinkler system is non-functional, the recommendation does not address the issue of whether or not the fire department will attempt to manually control**

the fire.

The fire at the First Interstate Bank Building in Los Angeles in 1988 clearly demonstrated that fire spread between floors can be controlled by "pre-wetting" combustibles on floors immediately above the fire. The "pre-wetting" tactic can be used whenever a large fire occurs in a high rise building where the sprinkler system fails to control the fire. Hence, fire spread between more than 2 floors should never occur in the event of a sprinkler system failure. Eventually, the fire will consume all of the combustibles on the 2 floors involved and, without further fuel, simply burn itself out.

It is my opinion that the fires in the WTC 7 Building would not have caused the collapse in the building if the FDNY had chosen to actively fight the fires. Given the events of earlier in the day, the FDNY certainly can't be criticized for making that decision.

Rich Schulte
Schulte & Associates
Building Code Consultants
Chicago/New Orleans (if New Orleans is not destroyed by Hurricane Gustav)

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov'" <terri ...snip... Cauffman <cauffman@nist.gov>
Subject: Fw: Fwd: ENR Question Responses

From: Shyam Sunder
To: 'FPESCHULTE@aol.com'
Sent: Wed Aug 27 11:59:21 2008
Subject: Re: Fwd: ENR Question Responses

Rich,

All 13 recommendations are in the summary WTC 7 report NCSTAR 1A.

Shyam

From: FPESCHULTE@aol.com
To: Shyam Sunder
Sent: Wed Aug 27 11:05:26 2008
Subject: Fwd: ENR Question Responses

From: Shyam Sunder <sunder@nist.gov>
To: '"terri@nist.gov"' <terri ...snip... Cauffman <cauffman@nist.gov>
Subject: Fw: ENR Question Responses

From: FPESCHULTE@aol.com
To: Nadine_Post@mcgraw-hill.com
Cc: Shyam Sunder
Sent: Wed Aug 27 10:41:32 2008
Subject: ENR Question Responses

Nadine-

I may have a few more comments in a day or two, but this should do for now.

2) Does this open up a can of worms re: liability and litigation? What do you think the ramifications might be if a building collapses in a fire after an engineer had a) evaluated a building frame, as recommended; and b) made recs to an owner that then are not addressed by the owner.

Response: Not really. The probability of a collapse due to a building fire is essentially nil. The fire safety record of steel-framed buildings protected by spray-applied fireproofing is actually magnificent.

3) Re: Legal liability: What do you think the ramifications might be if an engineer tells an owner that it does not think a building needs to be beefed up for a worst-case design fire and then a fire happens and the building collapses?

Response: The probability of a collapse due to a building fire is, for all practical purposes, zero.

In the case of WTC 7, the collapse only occurred as a result of a chain of improbable events. In the last 40 years, a major fire has never occurred in a sprinklered high rise building in the United States, other than as a result of the September 11th attacks.

Even if a sprinkler system protecting a steel-framed high rise office building did fail, manual firefighting operations should prevent a collapse. The collapse of the WTC 7 Building occurred due to the combined failure of the sprinkler system protecting the low zone of the building and the FDNY's decision not to fight the fire.

It is my opinion that designing buildings to withstand a September 11th attack is simply an irrational reaction to 9/11. High rise building designed to the codes which existed in 2001 provide more than adequate protection for our buildings. Just tweaking ASTM E119 a little should be all that is really necessary.

ENR statement, question: NIST says it does not have any cost data to support its contention that engineers should be able to find "cost-effective" fixes. Pls. react to this assumption that "fixes" could be cost-effective. Wouldn't this depend on the specific building design?

Response: Cost is relative. What really is of interest is cost/benefit. Since the

probability of a collapse is practically nil, the benefits of "fixing" the problem are essentially zero. Given this, the costs to "fix" for the problem will necessarily be high.

ENR questions: Pls. speak out in support of or otherwise the conclusions and recommendations in the report. I'm wondering, for example, whether designing for structures to resist thermal resistance would add to the cost of design and if so, by how much?

Response: Once again, cost is relative. The cost-effective solution to the problem has nothing to do with structural fire resistance, but making sprinkler systems protecting high rise buildings even more reliable than they already are. This could be easily and economically accomplished simply by providing a secondary water supply, a water storage tank, for the sprinkler system. Providing a water storage tank (or tanks) for a high rise building eliminates the total dependence on the municipal distribution system.

NIST was purposely silent about narrowing the field to any specific building type, size and whether the new standard (and code) should apply to new buildings or all buildings. Please react.

Response: The fire statistics for buildings protected by a sprinkler system clearly indicate that sprinklers address the fire problem and that sprinkler systems are highly reliable. Spending more money on additional passive fire protection than already required for buildings protected by a sprinkler system is a mistake.

Do you agree with NIST that "the standards for estimating load effects of potential hazards (e.g. progressive collapse, wind) and the design of structural systems to mitigate the effects of those hazards should be improved to enhance structural integrity"?

Response: NIST has identified a problem regarding how "structural restraint" is determined for purposes of determining fire resistance ratings. The solution to this problem is to expand ASTM E119's guidelines on "restraint" and to start to pay more attention to the protection of connections in steel construction. In other words, just a little tweak of ASTM E119.

rich

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov'" <terri@nist.gov>,
...snip... <cauffman@nist.gov>
Subject: Fw: Design Scenario 8

From: Shyam Sunder
To: 'FPESCHULTE@aol.com'
Cc: 'Nadine_Post@mcgraw-hill.com'
Sent: Thu Aug 28 10:57:21 2008
Subject: Re: Design Scenario 8

Rich,

Thanks for the clarification. We maintain the approach is consistent with NFPA. Our approach does not require both the active and the passive fire protection systems to be rendered ineffective simultaneously. We define the characteristice of such building fires based on historical experience which NFPA does not do adequately.

Shyam

From: FPESCHULTE@aol.com
To: Shyam Sunder
Cc: Nadine_Post@mcgraw-hill.com
Sent: Thu Aug 28 10:23:30 2008
Subject: Re: Design Scenario 8

In a message dated 8/27/2008 10:10:13 P.M. Central Daylight Time, sunder@nist.gov writes:

> Our position is consistent with the NFPA approach to design fire scenarios and the chavacteristics we have identified for them is consistent with fires experienced in several tall buildings.

Shyam-

The Life Safety Code indicates that the provisions contained in the Code are only based upon **a single fire**, not multiple fires, occurring in the building. (See section 4.3 in the 2006 edition of the LSC.) Hence, the assumption of fire spread to multiple floors would be from a fire originating at a single point in the building.

Design Scenario 8 (section 5.5.3.8 in the LSC-2006) does not require that both the passive and active fire protection systems be assumed to fail. Hence, if it assumed that the sprinkler system is non-functional, then it is assumed that the passive fire protection systems are still functional. Simultaneous failures of both the sprinkler system and passive fire protection systems (the floor construction) are not required to be assumed.

If the fire is assumed to originate at a single point in the building and the passive fire protection systems do not fail (Design Scenario 8), then the fire would be contained to a single floor.

Hence, the scenario contemplated in the NIST recommendations far exceeds the requirements contained in Design Scenario 8 in the LSC. Also note that Design

Scenario 8 does not contemplate no manual fire fighting.

rich

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov'" <terri@nist.gov>,
...snip... <cauffman@nist.gov>
Subject: Fw: Fwd: Design Scenario 8-Follow-Up

From: FPESCHULTE@aol.com
To: Nadine_Post@mcgraw-hill.com
Cc: Shyam Sunder
Sent: Thu Aug 28 12:02:37 2008
Subject: Fwd: Design Scenario 8-Follow-Up

In a message dated 8/28/2008 10:03:20 A.M. Central Daylight Time, sunder@nist.gov writes:

> Thanks for the clarification. We maintain the approach is consistent with NFPA. Our approach does not require both the active and the passive fire protection systems to be rendered ineffective simultaneously. We define the characteristice of such building fires based on historical experience which NFPA does not do adequately.

Nadine-

See the above. NIST is proposing a performance-design scenario which is far and above that required by the LSC and NFPA 5000.

The following are excerpts from the 2006 edition of the Life Safety Code:

4.3* Assumption. The protection methods of this Code assume a single fire source.

5.5.3.8* Design Fire Scenario 8. Design fire scenario 8 shall be as follows:

(1) It is a fire originating in ordinary combustibles in a room or area with each passive or active fire protection system independently rendered ineffective.

(2) It addresses concerns regarding the unreliability or unavailability of each fire protection system or fire protection feature, considered individually.

(3)*It is not required to be applied to fire protection systems for which both the level of reliability and the design performance in the absence of the system are acceptable to the authority having jurisdiction.

The NIST report does not make a case for assuming fire spread throughout all floors of a high rise building occurring at the same time that sprinkler system failure occurs and the fire department makes a decision not to apply water to the building.

The fire at the WTC 7 Building on September 11th is an excellent illustration. Despite the previous events of earlier that day, fire did not spread throughout all of the floors in the building. Even with the failure of the municipal water supply, it appears that the sprinkler system was still able to control the fires in the upper zones of the sprinkler system. If the low zone of the sprinkler system was provided with a water storage tank as a secondary supply, it is possible that WTC 7 would still be standing today.

Assuming sprinkler system failure followed by a major fire is an event which has never occurred in any high rise building fire in the United States, other than on 9/11. Assuming sprinkler system failure and failure of the fire department to manually fight the fire at the same time is a freak event.

The question after the WTC 7 report is really the same question which surfaced after the WTC 1 and WTC 2 report: should we design our buildings to withstand freak events. If the answer to the that question is yes, what freak occurrences should be used as a design basis? Hi-jacked airplanes intentionally flown into buildings, meteor and asteroid strikes or simultaneous massive hurricanes and massive snowstorms?

According to NIST, simply because it has never happened before, doesn't mean that it can't happen. We simply can't afford to design buildings for any and every freak event that could potentially occur-the list of events is endless. Given this, the question which NIST should address is why draw the line at simultaneous total burnout without sprinkler protection or manual fire fighting? Why not assume along with total burn-out another catastrophic building event?

Common sense and reason has to play a role in deciding the design basis for our high rise buildings. In my opinion, total burnout assuming sprinkler system failure and failure of the fire department to make any attempt to control the fire is outside the bounds of common sense and reason.

rich

Received: from rly-dc06.mx.aol.com (rly-dc06.mail.aol.com [172.19.136.35]) by air-dc06.mail.aol.com (v121_r2.12) with ESMTP id MAILINDC063-b2848b6be1e97; Thu, 28 Aug 2008 11:03:19 -0400
Received: from smtp.nist.gov (rimp2.nist.gov [129.6.16.227]) by rly-dc06.mx.aol.com (v121_r2.11) with ESMTP id MAILRELAYINDC064-b2848b6be1e97; Thu, 28 Aug 2008 11:02:54 -0400
Received: from wsex01.xchange.nist.gov (WSEX01.nist.gov [129.6.16.38])
by smtp.nist.gov (8.13.1/8.13.1) with ESMTP id m7SF2iVm023286;
Thu, 28 Aug 2008 11:02:44 -0400
Received: from wsex01.xchange.nist.gov ([129.6.16.38]) by
wsex01.xchange.nist.gov ([129.6.16.38]) with mapi; Thu, 28 Aug 2008 10:57:22 -0400
From: Shyam Sunder <sunder@nist.gov>
To: "'FPESCHULTE@aol.com'" <FPESCHULTE@aol.com>
CC: "'Nadine_Post@mcgraw-hill.com'" <Nadine_Post@mcgraw-hill.com>
Date: Thu, 28 Aug 2008 10:57:21 -0400
Subject: Re: Design Scenario 8
Thread-Topic: Design Scenario 8
Thread-Index: AckJGPv7WpLOsUnBR12/22j0ve8/FgABWPxX
Message-ID:
<9A7597AAF4D11D499C585567A505904601F7AAC253@wsex01.xchange.nist.gov>

Accept-Language: en-US
Content-Language: en-US
X-MS-Has-Attach:
X-MS-TNEF-Correlator:
acceptlanguage: en-US
x-nist-mailscanner: Found to be clean
x-nist-mailscanner-from: sunder@nist.gov
x-aol-ip: 129.6.16.227
x-aol-scoll-authentication: domain : nist.gov ; SPF_822_from = n
Content-Type: multipart/alternative;
boundary="_000_9A7597AAF4D11D499C585567A505904601F7AAC253wsex01xchange_"
MIME-Version: 1.0

Rich,

Thanks for the clarification. We maintain the approach is consistent with NFPA. Our approach does not require both the active and the passive fire protection systems to be rendered ineffective simultaneously. We define the characteristice of such building fires based on historical experience which NFPA does not do adequately.

Shyam

From: FPESCHULTE@aol.com
To: Shyam Sunder
Cc: Nadine_Post@mcgraw-hill.com
Sent: Thu Aug 28 10:23:30 2008
Subject: Re: Design Scenario 8

In a message dated 8/27/2008 10:10:13 P.M. Central Daylight Time, sunder@nist.gov writes:

> Our position is consistent with the NFPA approach to design fire scenarios and the chavacteristics we have identified for them is consistent with fires experienced in several tall buildings.

Shyam-

The Life Safety Code indicates that the provisions contained in the Code are only based upon **a single fire**, not multiple fires, occurring in the building. (See section 4.3 in the 2006 edition of the LSC.) Hence, the assumption of fire spread to multiple floors would be from a fire originating at a single point in the building.

Design Scenario 8 (section 5.5.3.8 in the LSC-2006) does not require that both the passive and active fire protection systems be assumed to fail. Hence, if it assumed that the sprinkler system is non-functional, then it is assumed that the passive fire protection systems are still functional. Simultaneous failures of both the sprinkler system and passive fire protection systems (the floor construction) are not required to be assumed.

If the fire is assumed to originate at a single point in the building and the passive fire protection systems do not fail (Design Scenario 8), then the fire would be contained to a single floor.

Hence, the scenario contemplated in the NIST recommendations far exceeds the requirements contained in Design Scenario 8 in the LSC. Also note that Design Scenario 8 does not contemplate no manual fire fighting.

rich

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov'" <terri@nist.gov>,
...snip... <cauffman@nist.gov>
Subject: Fw: Design Scenario 8 (Failures)

From: Shyam Sunder
To: 'FPESCHULTE@aol.com'
Cc: 'Nadine_Post@mcgraw-hill.com'
Sent: Fri Aug 29 07:29:50 2008
Subject: Re: Design Scenario 8 (Failures)

Rich,

I agree, consistent with the NFPA approach, designs should consider both scenarios: one in which the active system fails, the other in which the passive system (SFRM) fails.

With regard to the characteristics of the fire, the historical experience should provide guidance since the NFPA document does not do so adequately.

Nowhere in our report do we cite the NFPA design scenario; it is the general approach that guided us.

All our recommendations from our investigation of the WTC towers and WTC 7 have been performance-based changes to practice, standards, and codes.

Shyam

From: FPESCHULTE@aol.com
To: Shyam Sunder
Cc: Nadine_Post@mcgraw-hill.com
Sent: Fri Aug 29 06:26:49 2008
Subject: Re: Design Scenario 8 (Failures)

In a message dated 8/28/2008 10:03:20 A.M. Central Daylight Time, sunder@nist.gov writes:

> Thanks for the clarification. We maintain the approach is consistent with NFPA. Our approach does not require both the active and the passive fire protection systems to be rendered ineffective simultaneously. We define the characteristice of such building fires based on historical experience which NFPA does not do adequately.

Shyam-

NIST's interpretation of the LSC Design Scenario 8 is incorrect.

The following summarizes NIST's position with respect to Design Scenario 8:

Sprinkler System:	fails
Manual Fire Fighting:	fails to take any action
Floor-to-Floor Compartmentation:	fails to contain fire spread to 2 floors

NIST's proposed approach to building design assumes three total failures in the building fire protection system design. While NIST assumes total failures of the sprinkler system, fire

department and building compartmentation , NIST then proposes to assume that the building's structural fire protection can be made to be 100 percent effective.

Based upon my field experience, I have never seen a building where the insulation of a building's structural steel frame has been installed correctly throughout the building and then maintained in this state throughout the life of the building. NIST's recommendation does not provide any guidance with respect to the assumption regarding the adequacy of the SFRM installation and the maintenance of the SFRM installation. The changes to the IBC regarding the inspection of SFRM installations in no way guarantees that the installation will be 100 percent effective thirty or forty years after the building is constructed.

In summary, on the one hand, NIST assumes that the sprinkler system will fail, that the fire department will fail to respond to the fire and that the floor-to-floor compartment will fail and then assumes that the building's SFRM will be installed and maintained so that it achieves 100 percent effectiveness. The least likely of all four of the different types of protection provided to be installed 100 percent correctly and to be maintained perfectly is the SFRM installation.

Given the above, NIST's recommendation regarding designing the structural frame to resist a total burn-out of the building appears to defy logic and common sense.

NIST's explanation of why NIST believes that the design should be based upon the complete failure of 3 of the 4 fire protection systems provided for high rise buildings, while at the same time assuming that the fourth fire protection system in a building will be completely effective would be of interest. No fire protection provided in a building will ever be 100 percent effective over the life of a high rise building. The closest that we have come to 100 percent effectiveness is the sprinkler system.

rich

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov'" <terri@nist.gov>,
...snip... <cauffman@nist.gov>
Subject: Fw: Design Scenario 8 (Failures)

From: Shyam Sunder
To: 'FPESCHULTE@aol.com'
Cc: 'Nadine_Post@mcgraw-hill.com'
Sent: Fri Aug 29 08:52:40 2008
Subject: Re: Design Scenario 8 (Failures)

Rich,

As with all our recomendstions, specific code change proposals will now need to be developed through industry participation and leadership.

We continue to maintain that our "approach" is consistent with the NFPA approach with more specific characteristics of design fires based on historical experience as stated in our report.

Shyam

From: FPESCHULTE@aol.com
To: Shyam Sunder
Cc: Nadine_Post@mcgraw-hill.com
Sent: Fri Aug 29 08:32:01 2008
Subject: Re: Design Scenario 8 (Failures)

In a message dated 8/29/2008 6:35:34 A.M. Central Daylight Time, sunder@nist.gov writes:

| Nowhere in our report do we cite the NFPA design scenario; it is the general approach that guided us.

Shyam, I agree, however, in one of your recent e-mail notes you indicated that the NIST recommendation was consistent with NFPA design scenarios. My point is that the NIST recommendation is not consistent with NFPA design scenarios. It far exceeds the NFPA design scenario #8.

Again, the NIST recommendation does not address the assumptions regarding SFRM. Is it NIST's intent to assume that SFRM for steel is 100 percent effective (unlikely) or is it NIST intent to assume a lesser degree of protection by SFRM than 100 percent? If it is less than 100 percent effective, what guidance do designers have from NIST regarding the effectiveness of SFRM. Missing SFRM at a strategic point could compromise the protection provided by SFRM (as was noted in the WTC 1/WTC 2 report.

NIST's recommendation is incomplete at best. It doesn't seem that this recommendation has actually been completely thought out and a whole lot more thought on this recommendation is needed.

rich

rich

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov'" <terri@nist.gov>,
...snip... <cauffman@nist.gov>
Subject: Fw: Design Scenario 8 (Failures)

From: Shyam Sunder
To: 'FPESCHULTE@aol.com'
Sent: Fri Aug 29 09:27:42 2008
Subject: Re: Design Scenario 8 (Failures)

Rich,

We obviously disagree. You are interpreting from a prescriptive and literal viewpoint. We are not.

Take care as Gustav makes landfall.

Have a great weekend.

Shyam

From: FPESCHULTE@aol.com
To: Shyam Sunder
Sent: Fri Aug 29 09:04:35 2008
Subject: Re: Design Scenario 8 (Failures)

In a message dated 8/29/2008 7:58:18 A.M. Central Daylight Time, sunder@nist.gov writes:

> We continue to maintain that our "approach" is consistent with the NFPA approach with more specific characteristics of design fires based on historical experience as stated in our report.

Shyam-

As my grandfather used to say, "shoot yourself". It's very apparent that the recommendation is not consistent with NFPA Design Scenario #8. I don't expect to be able to persuade you of that, but at least I tried. NIST's credibility is on the line. My recommendation is for NIST to avoid making that statement. Just some advice, but I don't expect that NIST will heed the advice. Hence, the reason for my grandfather's missive.

rich

From: Shyam Sunder <sunder@nist.gov>
To: "'terri@nist.gov'" <terri@nist.gov>,
...snip... <cauffman@nist.gov>
Subject: Fw: Bolt Failure-NCSTAR 9 (page 718)

From: Shyam Sunder
To: 'FPESCHULTE@aol.com' ; 'Nadine_Post@mcgraw-hill.com'
Sent: Mon Sep 01 12:54:19 2008
Subject: Re: Bolt Failure-NCSTAR 9 (page 718)

Rich,

The focus is on a "methodology". This implies an accepted/established methodology, particularly one that can be used routinely in practice.

We used a detailed and rigorous modeling approach that would not be an approach to use routinely in practice.

We also clearly indicate that our modeling approach is sufficient to come up with firm findings and recommendations.

Our recommendations call for much greater effort in developing an understanding and filling critical gaps in knowledge about the fire behavior of structural systems, including connections.

I am glad Gustav has spared New Orleans. Be safe!

Shyam

From: FPESCHULTE@aol.com
To: Nadine_Post@mcgraw-hill.com
Cc: Shyam Sunder
Sent: Mon Sep 01 12:03:52 2008
Subject: Bolt Failure-NCSTAR 9 (page 718)

Nadine-

This excerpt taken from page 718 of the NIST report is rather interesting:

"***Bolt failure is complex both at room- and elevated-temperature and no methodology exists for modeling the failure of bolts, as distinct from the steels in which they are made, at elevated temperature.***"

Of course, this raises the question of whether or not the modeling of a structural steel frame at elevated temperatures is actually accurate and, perhaps, calls into question whether or not we have sufficient knowledge to perform a reasonably accurate structural analysis under "worst case" fire conditions as recommended by NIST.

On another note, the hurricane is pretty much over as far as New Orleans is concerned (I think). Actually, it was no big deal. The trash cans on the street are upright and still where they were yesterday. My apartment is in the business district and the lights are still on. So far, not much rain in downtown. Looks like the levees protecting New Orleans held. I sure

am glad I couldn't leave yesterday-sitting in bumper-to-bumper traffic for 10 hours would have been far more nerve-racking that the 60 mph winds we got here. I guess I should thank the hotel engineer for locking up the parking garage so I couldn't get my car out.

rich